

In the Claims

1. (Currently Amended) A motion controlled handheld device comprising:
 - a first accelerometer operable to detect acceleration along a first axis;
 - a second accelerometer operable to detect acceleration along a second axis, the second axis perpendicular to the first axis;
 - a tilt detection component operable to detect rotation having a component around at least one of the first axis and the second axis, wherein the tilt detection component comprises:
 - a first camera operable to generate a first video stream, the first camera aligned to focus in a first direction along a third axis, the third axis perpendicular to the first axis and perpendicular to the second axis;
 - a second camera operable to generate a second video stream, the second camera aligned to focus in a second direction along the third axis, the second direction opposite the first direction; and
 - a video analysis module operable to detect a direction of motion of the device based at least on the first video stream;
 - a display operable to present a current image;
 - a motion tracking module operable to track motion of the device in three dimensions using the first accelerometer, the second accelerometer, and the tilt detection component; and
 - a controller operable to generate the current image and to modify the current image in response to the motion of the device.
2. (Original) The motion controlled handheld device of Claim 1, wherein:
 - the display comprises a viewable surface; and
 - the first axis and the second axis are substantially parallel to the viewable surface.

3. (Original) The motion controlled handheld device of Claim 1, wherein:
the tilt detection component comprises a third accelerometer operable to detect acceleration along a third axis, the third axis perpendicular to the first axis and perpendicular to the second axis; and wherein:
the motion tracking module is further operable to distinguish translation within a plane formed by the first axis and the second axis from rotation having a component around at least one of the first axis and the second axis based upon the acceleration measured by the third accelerometer.

4. (Currently Amended) The motion controlled handheld device of Claim 1,
wherein the tilt detection component comprises:

a third accelerometer operable to detect acceleration along a third axis, the third axis perpendicular to the first axis and perpendicular to the second axis.

~~a camera operable to generate a video stream; and~~
~~a video analysis module operable to detect a direction of motion based on the video stream.~~

5. (Canceled)

6. (Canceled)

7. (Canceled)

8. (Currently Amended) The motion controlled handheld device of ~~Claim 6~~
Claim 1, wherein the video analysis module is further operable to:

detect first edges of objects in the first video stream;
detect second edges of objects in the second video stream;
identify movement of the first edges and the second edges;
determine a differential between the movement of the first edges and the movement of the second edges; and
determine tilt components and translation components based on the differential.

9. (Original) The motion controlled handheld device of Claim 1, further comprising:

a gesture database comprising a plurality of gestures, each gesture defined by a motion of the device with respect to a first position of the device; and

a gesture mapping database mapping each of the gestures to a corresponding command; and wherein

the controller is further operable to compare the tracked motion of the device against the gestures to determine a received gesture, to identify the corresponding command mapped to the received gesture, and to execute the identified command to modify the current image.

10. (Original) The motion controlled handheld device of Claim 1, wherein:

the motion tracking module is further operable to identify translation of the device within a plane formed by the first axis and the second axis based upon motion of the device;

the current image displays a subsection of a larger image; and

the controller is further operable to continuously modify the current image to display another subsection of the larger image based on a resulting position of the device resulting from the translation.

11. (Original) The motion controlled handheld device of Claim 1, wherein the motion tracking module is further operable to disregard acceleration detected by the first accelerometer and acceleration detected by the second accelerometer that register below a noise threshold.

12. (Currently Amended) A method for controlling a handheld device comprising:

detecting acceleration along a first axis using a first accelerometer;

detecting acceleration along a second axis using a second accelerometer, the second axis perpendicular to the first axis;

detecting rotation having a component around at least one of the first axis and the second axis using a tilt detection component;

generating a first video stream by a first camera of the tilt detection component, the first camera aligned to focus in a first direction along a third axis, the third axis perpendicular to the first axis and perpendicular to the second axis;

generating a second video stream by a second camera of the tilt detection component, the second camera aligned to focus in a second direction along the third axis, the second direction opposite the first direction;

detecting a direction of motion of the device based at least on the first video stream;

tracking motion of the device in three dimensions using the first accelerometer, the second accelerometer, and the tilt detection component; and

displaying a current image using a display of the device and modifying the current image in response to the tracked motion of the device.

13. (Original) The method of Claim 12, wherein:

the display comprises a viewable surface; and

the first axis and the second axis are substantially parallel to the viewable surface.

14. (Original) The method of Claim 12, further comprising:

detecting acceleration along a third axis using a third accelerometer of the tilt detection component, the third axis perpendicular to the first axis and perpendicular to the second axis; and

distinguishing translation within a plane formed by the first axis and the second axis from rotation having a component around at least one of the first axis and the second axis based upon the acceleration measured by the third accelerometer.

15. (Currently Amended) The method of Claim 12, further comprising:
detecting acceleration along a third axis using a third accelerometer of the tilt
detection component, the third axis perpendicular to the first axis and perpendicular to the
second axis. ~~and~~
~~monitoring a video stream generated by a camera of the device; and~~
~~detecting a direction of motion based on the video stream.~~

16. (Currently Amended) The method of Claim 15 Claim 12, further comprising:
determining distance information including a distance between the device and an
object in the video stream; and
determining a magnitude of translation of the device using the distance.

17. (Canceled)

18. (Currently Amended) The method of Claim 17 Claim 12, further comprising:
detecting first edges of objects in the first video stream;
detecting second edges of objects in the second video stream;
identifying movement of the first edges and the second edges;
determining a differential between the movement of the first edges and the movement
of the second edges; and
determining tilt components and translation components based on the differential.

19. (Original) The method of Claim 12, further comprising:
comparing the tracked motion of the device against a gesture database, the gesture
database comprising a plurality of gestures with each gesture defined by a motion of the
device with respect to a first position of the device;
identifying a command mapped to the received gesture; and
executing the identified command to modify the current image.

20. (Currently Amended) Logic for controlling a handheld device, the logic embodied as a computer program stored on in a computer readable medium and operable when executed to perform the steps of:

detecting acceleration along a first axis using a first accelerometer;

detecting acceleration along a second axis using a second accelerometer, the second axis perpendicular to the first axis;

detecting rotation having a component around at least one of the first axis and the second axis using a tilt detection component;

generating a first video stream by a first camera of the tilt detection component, the first camera aligned to focus in a first direction along a third axis, the third axis perpendicular to the first axis and perpendicular to the second axis;

generating a second video stream by a second camera of the tilt detection component, the second camera aligned to focus in a second direction along the third axis, the second direction opposite the first direction;

detecting a direction of motion of the device based at least on the first video stream;

tracking motion of the device in three dimensions using the first accelerometer, the second accelerometer, and the tilt detection component; and

displaying a current image using a display of the device and modifying the current image in response to the tracked motion of the device.

21. (Original) The logic of Claim 20, further operable when executed to perform the steps of:

detecting acceleration along a third axis using a third accelerometer of the tilt detection component, the third axis perpendicular to the first axis and perpendicular to the second axis; and

distinguishing translation within a plane formed by the first axis and the second axis from rotation having a component around at least one of the first axis and the second axis based upon the acceleration measured by the third accelerometer.

22. (Currently Amended) The logic of Claim 20, further operable when executed to perform the steps of:

detecting acceleration along a third axis using a third accelerometer of the tilt detection component, the third axis perpendicular to the first axis and perpendicular to the second axis. ~~and~~

~~monitoring a video stream generated by a camera of the device; and~~

~~deteeting a direction of motion based on the video stream.~~

23. (Original) The logic of Claim 20, further operable when executed to perform the steps of:

determining distance information including a distance between the device and an object in the video stream; and

determining a magnitude of translation of the device using the distance.

24. (Canceled)

25. (Currently Amended) The logic of ~~Claim 24~~ Claim 20, further operable when executed to perform the steps of:

detecting first edges of objects in the first video stream;

detecting second edges of objects in the second video stream;

identifying movement of the first edges and the second edges;

determining a differential between the movement of the first edges and the movement of the second edges; and

determining tilt components and translation components based on the differential.

26. (Original) The logic of Claim 20, further operable when executed to perform the steps of:

comparing the tracked motion of the device against a gesture database, the gesture database comprising a plurality of gestures with each gesture defined by a motion of the device with respect to a first position of the device;

identifying a command mapped to the received gesture; and
executing the identified command to modify the current image.

27. (Currently Amended) A motion controlled handheld device comprising:
means for detecting acceleration along a first axis;
means for detecting acceleration along a second axis, the second axis perpendicular to the first axis;

means for detecting rotation having a component around at least one of the first axis and the second axis;

means for generating a first video stream by a first camera of the tilt detection component, the first camera aligned to focus in a first direction along a third axis, the third axis perpendicular to the first axis and perpendicular to the second axis;

means for generating a second video stream by a second camera of the tilt detection component, the second camera aligned to focus in a second direction along the third axis, the second direction opposite the first direction;

means for detecting a direction of motion of the device based at least on the first video stream;

means for tracking motion of the device in three dimensions based upon the acceleration along the first axis, the acceleration along the second axis, and the rotation; and

means for displaying a current image using a display of the device and modifying the current image in response to the tracked motion of the device.

28. (New) A motion controlled handheld device, comprising:

- a first accelerometer operable to detect acceleration along a first axis;
- a second accelerometer operable to detect acceleration along a second axis, the second axis perpendicular to the first axis;
- a tilt detection component operable to detect rotation having a component around at least one of the first axis and the second axis, the tilt detection component comprising:
 - a camera operable to generate a video stream;
 - a video analysis module operable to detect a direction of motion based on the video stream;
 - a range finder operable to determine distance information including a distance between the device and an object in the video stream, wherein the video analysis module is further operable to determine a magnitude of translation of the device using the distance;
 - a display operable to present a current image;
 - a motion tracking module operable to track motion of the device in three dimensions using the first accelerometer, the second accelerometer, and the tilt detection component; and
 - a controller operable to generate the current image and to modify the current image in response to the motion of the device.